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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/821,175

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EXAMINER

COLE, ELIZABETH M

ART UNIT

PAPER NUMBER

1794

MAIL DATE

DELIVERY MODE

03/28/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/821,175	Applicant(s) NOGUCHI ET AL.	
	Examiner Elizabeth M. Cole	Art Unit 1794	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 January 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10 and 23-29 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-10, 23-29 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 1/15/08 has been entered.

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-10, 23-29 are rejected under 35 U.S.C. 103(a) as obvious over Fisher et al, U.S. Patent No. 6,203,814 in view of Brennan et al, U.S. Patent NO. 5,844,523. Fisher discloses a composite material comprising carbon nanofibers having a diameter of less than 0.5u, (col. 4, lines 45-46), which can be dispersed in an elastomer such as natural rubber, styrene-butadiene rubber or polybutadiene, (col. 7, lines 1-9). Since the elastomers disclosed comprise an unsaturated bond or group, the elastomers would necessarily have the claimed affinity to the carbon nanofibers and the claimed molecular weights. Fisher discloses that there is an affinity between the nanofibers and the elastomers. See abstract. Fisher does not disclose the claimed spin-spin relaxation time of the network components as measured by the Hahn-echo method using pulsed

NMR techniques, however, since the same materials are employed and the same results are obtained, it is reasonable to presume that the materials of Fisher would have the claimed spin-spin relaxation time. Also, Fisher teaches that the functionalized carbon fibrils are better dispersed into polymer systems, including elastomers, in theory, because the modified surface properties of the fibrils are more compatible with the polymer, or because the modified functional groups, particularly hydroxyl or amine groups are bonded directly to the polymer as terminal groups. Therefore, Fisher is teaching that dispersion of the fibrils is a result effective variable with is related to the surface properties of the modified fibers and/or to the compatibility of the matrix polymer with the functional groups. Therefore, the person of ordinary skill in the art would have been able to select the functional groups of the modified fibrils in order to arrive at fibrils which would be best able to be dispersed in the polymer systems. The elastomer is not disclosed as being crosslinked or uncrosslinked, but instead the reference is silent as to this feature. Brennan et al teaches that elastomers such as rubbers into which filler such as fibers can be dispersed can be either crosslinked or uncrosslinked. See col. 7, line 65 – col. 8, line 10. Therefore, since Fisher et al is silent as to whether crosslinked or uncrosslinked elastomers are employed and Brennan teaches that both crosslinked and uncrosslinked elastomers are suitable for use to form composite materials into which fillers such as fibers are mixed, one of ordinary skill in the art at the time the invention was made would have been motivated to have employed either crosslinked or uncrosslinked elastomers as the elastomer resin component taught by Fisher et al because Brennan et al teaches that both types of elastomers can be used in

such composite materials. With regard to the amendment reciting that the fibers are substantially uniformly dispersed, Fisher teaches at col. 7, lines 10-18 that carbon fibers are easily dispersed in the elastomer composition.

4. Applicant's arguments filed 1/15/08 have been fully considered but they are not persuasive. Applicant's argument refer to the Declaration filed 1/15/08 which shows that material of Fisher has aggregates of the nanofibers. These arguments are not persuasive with regard to the reasons set forth below. Further, with regard to Fisher generally, Fisher teaches that the functionalized carbon fibrils are better dispersed in to polymer systems, including elastomers, in theory because the modified surface of the fibrils are more compatible with the polymer, and/or because the modified functional groups, particularly hydroxyl or amine groups, are bonded directly to the polymer as terminal groups. In this way, the fibrils are easier to disperse with improved adherence. Therefore, Fisher is teaching that dispersion of the fibrils is a result effective variable with is related to the surface properties of the modified fibers and/or to the compatibility of the matrix polymer with the functional groups. Therefore, the person of ordinary skill in the art would have been able to select the functional groups of the modified fibrils in order to arrive at fibrils which would be best able to be dispersed in the polymer systems. As noted in the previous rejection, the instant specification at page 2 teaches that the uniform dispersal of the fibers is due to the bonding of the unsaturated bond or group of the elastomer with an active part of the carbon nanofiber, which weakens the aggregating force of the carbon nanofiber and enables enhances of its dispersaibility and that as a result of this the material can have a structure wherein the carbon

nanofiber is homogeneously dispersed into the elastomer. See specification, at lines 12-21. This seems to be the same mechanism of improved dispersion taught by Fisher.

5. The Declaration under 37 CFR 1.132 filed 1/15/08 is insufficient to overcome the rejection of claims based upon Fisher as set forth in the last Office action because: the showing is not commensurate in scope with what is shown in Fisher. Fisher teaches a variety of fiber length, sizes and teaches various type of fibers with various functional groups, not just sulfonated carbon fibers. Fisher also teaches mixing the carbon nanofibers in other elastomers besides natural rubber, such as styrene-butadiene rubber or polybutadiene. Therefore, the showing is not commensurate in scope with the disclosure of Fisher and therefore the rejection is maintained.

6. All claims are drawn to the same invention claimed in the application prior to the entry of the submission under 37 CFR 1.114 and could have been finally rejected on the grounds and art of record in the next Office action if they had been entered in the application prior to entry under 37 CFR 1.114. Accordingly, **THIS ACTION IS MADE FINAL** even though it is a first action after the filing of a request for continued examination and the submission under 37 CFR 1.114. See MPEP § 706.07(b).

Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any

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extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Elizabeth M. Cole whose telephone number is (571) 272-1475. The examiner may be reached between 6:30 AM and 6:00 PM Monday through Wednesday, and 6:30 AM and 2 PM on Thursday.

Mr. Terrel Morris, the examiner's supervisor, may be reached at (571) 272-1478.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

The fax number for all official faxes is (571) 273-8300.

/Elizabeth M. Cole/
Primary Examiner, Art Unit 1794

e.m.c